UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,082	04/24/2001	Joo Soo Lim	049128-5006	2174

9629 7590 05/03/2007
MORGAN LEWIS & BOCKIUS LLP
1111 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20004

EXAMINER	
QI, ZHI QIANG	
ART UNIT	PAPER NUMBER
2871	

MAIL DATE	DELIVERY MODE
05/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/840,082	LIM ET AL.	
	Examiner	Art Unit	
	Mike Qi	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,9,11-13,19,21 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,9,11-13,19,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Dec.20, 2007 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 9, 11-13, 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 6,297,862 (Murade) and US 5,339,181 (Kim et al).

Regarding claims 1, 9, 11, 19 and 22, **AAPA** teaches (paragraph 0006 – paragraph 0010; Figs. 1-3) a conventional liquid crystal display comprising:

- a pixel electrode (10) at a pixel area between a gate line (14) and data line (13);
- a switching device (thin film transistor TFT) (12) at an intersection between the gate line (14) and the data line (13), and having drain electrode (7) is

made of metal connected to the pixel electrode (10) (see Fig.2) as a first metal film ;

- a light-shielding member (black matrix) (11) as a first light-shielding member overlapping the switching device (TFT) (12) and also on the first metal film (the drain electrode (7);
- a charging device (a storage capacitor 19 between the gate line 14 as the lower electrode and the upper metal thin film 15 as the upper electrode or a second metal film overlapping the pixel electrode 10) on the gate line (14), therefore, the charging device is a storage capacitor (19) including the upper electrode (metal) (15) (a second metal film overlapping the pixel electrode) and the gate line (14) and a gate insulating layer (4) (dielectric layer) between the gate line (14) and the upper electrode (15); or forming a charging device including upper electrode (15) made of metal (second metal film on the rear substrate and overlapping the pixel electrode) over the gate line (14) and a dielectric layer (gate insulating layer 4 as shown in Fig.3);
- a light-shielding member (black matrix) (11) overlapping the drain electrode (7) of the switching device (TFT) (12) (the first metal thin film) functions as the first light-shielding member or the first dummy black matrix;
- a light-shielding member (black matrix) (11) overlapping the charging device (19) (the storage capacitor) also functions as the second light-shielding member or the second dummy black matrix;

(concerning claims 1, 9 and 19)

- drain electrode (7) made of metal (first metal thin film) connected to the pixel electrode (10) (see Fig.2);
- upper electrode (15) made of metal (second metal thin film) on the gate line (14) and a gate insulating layer (4) (dielectric layer) forming a charging device (capacitor) and overlapping the pixel electrode (10);
- a light-shielding member (black matrix) (11) on a front substrate (2) opposed to the rear substrate (1), and at a boundary portion between pixel areas (10) (see Figs.1 and 2);
- a light-shielding member (black matrix) (11) for blocking light incident onto the drain electrode (7) (first metal thin film) of the switching device (TFT) (12) and for blocking light incident onto the storage capacitor upper electrode (15) (second metal thin film).

AAPA does not expressly disclose the first light-shielding member (black matrix) extending from ends of the first metal (drain electrode) into the pixel area and the second light-shielding member (black matrix) extending from ends of the second metal film (upper electrodes of the storage capacitor) into the pixel area so as to provide a margin sufficient to block light incident on the first and second metal films (drain electrodes and upper electrodes of the storage capacitor.

Murade teaches (col.7, line 11 – col.9, line 67; col.16, line 43 – col.17, line 53; Figs.1, 2, 11-14, 20) that the shielding film (black matrix 6) is formed around the pixel, and the shielding film (black matrix 6) covering the switching device (TFT, such as the source/drain regions 1a and 1b as shown in Fig. 2) and extending from the drain region

into the pixel area, and the light shielding member (black matrix 6) covering and extending over the drain/source region, and the light shielding member (black matrix 6) also extending over the upper electrode of a storage capacitor (any two conductive layers and an insulating layer would constitute a capacitor) such as the data line (3) made of metal (aluminum) (see col.7, lines 28-29) and gate line (2) (or there is a metal film 7) and insulating film (13, 12, 11) that constitutes a capacitance (charging device or storage capacitor) (see Fig.2) , and that is sufficient to block light incident onto the drain/source region (the metal thin film), and the light incident on the liquid crystal device does not affect the TFT performance, and a bright, high quality images will be ensured (see col.6, lines 4-6).

Since such light-shielding arrangement would sufficiently block the light incident to the TFT, so as to minimize the leakage current of the TFT. Murade indicates (col.9, lines 58 –67) that such black matrix (6) as shown in Fig.2 covering (overlapping and extending) the TFT including the drain electrode and storage capacitance and the side portion of the pixel electrode would present a display of high quality images free from image degrading effect such as cross-talk.

Further, **Kim** teaches (col.3, line 40 – col.5, line 25; Fig.1A) that a liquid crystal display device of a prior art in which the first electrode (10) of each storage capacitor C (as the second metal film of this application), the gate line (1) and the insulating layer (2) forming a storage capacitor C; and the black matrix light shielding layer (20) overlapping the switching device (TFT) and extending from ends of the drain/source electrode (5a, 5b) (as first metal film of this application) into the pixel area (4) as shown

in Fig.1A; and the black matrix light shielding layer (20) on the electrode (10) (as the second metal film of this application) overlapping the storage capacitor C and extending from ends of the electrode (10) (as the second metal film of this application), and the storage capacitor C overlapping the pixel electrode (4) as shown in Fig.1A. Kim further teaches (col.5, lines 9-14) that the electrode (10) of each storage capacitor C substantially surrounding each pixel electrode so as to serve as an additional light shielding layer, such that the light shielding structure (overlapping the TFT and the storage capacitor) provides a margin sufficient to block light incident onto the TFT and the storage capacitor, and that would have been at least obvious.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the liquid crystal display device of AAPA with the teachings of extending the light-shielding film covering the drain electrode and covering the storage capacitor upper electrode from as taught by Murada and Kim, since the skilled in the art would be motivated for minimizing the leakage current of the TFT, improving the display contrast, and presenting a display of high quality images free from image degrading effect such as cross-talk so as to provide a margin sufficient to block light incident onto the TFT and the storage capacitor.

Regarding claims 2 and 12, AAPA teaches (paragraph 0006 – paragraph 0010; Figs. 1-3) that the light-shielding member (11) is at a front substrate (2) opposed to a rear substrate (1) which includes the switching device (TFT 12), pixel electrode (10), the charging device (storage capacitor 19), and a liquid crystal layer between the two substrates.

Regarding claims 3 and13, AAPA discloses (paragraph 0006 – paragraph 0010; Figs. 1-3) that the light-shielding member is a black matrix.

3. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA Murade and Kim as applied to claims 1-3, 9, 11-13, 19 and 22 above, and further in view of US 6,266,117 (Yanagawa et al).

Regarding claim 21, AAPA, Murada and Kim teach the invention set forth above except for that the material of the light-shielding member is an organic material containing a black pigment,

Yanagawa teaches (co.7, lines 1-2) that the light shielding film is made of an organic resin in which, e.g., black pigment is dispersed, so that using the organic resin containing a black pigment as a light shielding member would be a routing skill in the art, and that was common and known in the art as the light shielding property of the organic material containing a black pigment to absorb light.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the liquid crystal display device of AAPA, Murada and Kim with the teachings of using an organic material containing a black pigment to form a light shielding member as taught by Yanagawa, since the skilled in the art would be motivated for absorbing light because the organic material containing a black pigment having the property to absorb light.

Response to Arguments

4. Applicant's arguments filed on Dec.20, 2006 have been fully considered but they are not persuasive.

1) In response to applicant's arguments that the references do not relate and disclose a device comprising a charging device having a second metal film that extends into a pixel area so that it overlaps the pixel electrode, it is respectfully pointed out that Murade teaches (col.7, line 11 – col.9, line 67; col.16, line 43 – col.17, line 53; Figs.1, 2, 11-14, 20) that the shielding film (black matrix 6) is formed around the pixel, and the shielding film (black matrix 6) covering the switching device (TFT, such as the source/drain regions 1a and 1b) and extending from the drain region into the pixel area, and the light shielding member (black matrix 6) covering and extending over the drain/source region, and the light shielding member (black matrix 6) also extending over the upper electrode of a storage capacitor (any two conductive layers and an insulating layer would constitute a capacitor) such as the data line (3) made of metal (aluminum) and gate line (2) (or there is a metal film 7) and insulating film (13, 12, 11) that constitutes a capacitance (charging device or storage capacitor) (AAPA also discloses the black matrix 11 covering the storage capacitor 19 as shown in Fig.3), and that is sufficient to block light incident onto the drain/source region (the metal thin film), and the light incident on the liquid crystal device does not affect the TFT performance, and a bright, high quality images will be ensured.

The reference Murade described in the summary of the invention that a black matrix can be safely omitted which does not mean without black matrix in the liquid

crystal display device, and the Figs 1 and 2 clearly show the black matrix (6) covering and extending overlapping the drain electrode and a capacitance and the side of the pixel electrode.

Further Kim teaches (col.3, line 40 – col.5, line 25; Fig.1A) that a liquid crystal display device of a prior art in which the first electrode (10) of each storage capacitor C (as the second metal film of this application), the gate line (1) and the insulating layer (2) forming a storage capacitor C; and the black matrix light shielding layer (20) overlapping the switching device (TFT) and extending from ends of the drain/source electrode (5a, 5b) (as first metal film of this application) into the pixel area (4) as shown in Fig.1A; and the black matrix light shielding layer (20) on the electrode (10) (as the second metal film of this application) overlapping the storage capacitor C and extending from ends of the electrode (10) (as the second metal film of this application), and the storage capacitor C overlapping the pixel electrode (4) as shown in Fig.1A. Kim further teaches (col.5, lines 9-14) that the electrode (10) of each storage capacitor C substantially surrounding each pixel electrode so as to serve as an additional light shielding layer, such that the light shielding structure (overlapping the TFT and the storage capacitor) provides a margin sufficient to block light incident onto the TFT and the storage capacitor, and that would have been at least obvious.

2) The applicant's arguments filed on Dec.20, 2007 stated claims 1-3, 9,11-13,19 and 21-23 are presently pending. However, the amended claims are claims 1-3,9,11-13, 19 and 21-22. Therefore, the examination set forth above is for claims 1-3, 9, 11-13, 19 and 21-22.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mike QI
Patent examiner
April 30, 2007